STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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MEMORANDUM TO: Project Engineers
Project Design Engineers

FROM: G. R. Perfetti, P. E.
State Bridge Design Engineer

DATE: April 4, 2006

SUBJECT: BRIDGE OVERLAYS (Revised)

For box beam and cored slab bridges, detail either an asphalt or a lightly reinforced concrete overlay. The type of overlay shall be based on the bridge location and the traffic conditions.

In general, the concrete overlay is preferred for its durability and shall be specified on bridges that satisfy any of the following criteria:

- Bridges on NHS routes
- Bridges with design year ADT greater than 5,000
- Bridges with design year TTST greater than 100
- Low water bridges located in Divisions 11-14

Bridges that do not meet the above criteria may be detailed with an asphalt overlay.

Concrete overlays shall be reinforced with #3 (#10) bars spaced at 6" (150mm) centers in both the longitudinal and transverse directions. This reinforcing steel mat shall be placed such that the 2" (50mm) clear cover is maintained throughout the overlay surface. Reinforcement in the transverse direction may be placed along the skew. Include full plan details to show the overlay reinforcing steel with a complete bill of material, and the required beam bolsters (BB) at mid-span and centerline bearing. If different height beam bolsters are required to maintain the clear cover, then show the required BB heights at or near the gutter line and at the location that requires the tallest BB. The maximum beam bolster spacing shall be 2'-0" (600mm).

Where concrete overlay is detailed, place the following note on the plans:

> ***Placement of the concrete wearing surface shall occur after casting the concrete rail. The cost of the #3 (#10) bars cast with the concrete wearing surface shall be included in the unit price bid for concrete wearing surface. For concrete wearing surface, see special provisions.***

Project Engineers

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Since the concrete overlay is only lightly reinforced, avoid detailing relatively deep sections of the concrete overlay. If the roadway plans show a normal crown on a bridge that will have a concrete overlay, then request the Roadway Unit to investigate whether it is possible to revise that section of roadway to a constant superelevation to minimize the overlay thickness.

Consider eliminating joints in concrete overlays. For bridges where adjacent spans, supported on the same bent, are each detailed for a fixed condition, the concrete overlay shall be continuous over the joint. In addition:

- Detail additional 20'-0" long #4 (#13) longitudinal reinforcing steel bars spaced at 6" (150mm) centers, centered over the joint, and placed between existing longitudinal bars,
- Detail a continuous backer rod (joint material) at or near the bottom of the superstructure units, and
- Detail grout to fill the gap between the superstructure units of adjacent spans. This grout should be the same as that used to fill the anchor bolt holes.

For a fixed condition at the end bent, detail grout to fill the gap between the superstructure unit and the approach slab or backwall and detail a saw-cut filled with silicone at the cold joint between the concrete overlay and the approach slab.

When through-the-rail drainage is required or an asphalt overlay is shown, detail a flat-faced rail with drainage slots through the rail parapet whenever possible. Note that rails rated at a Test Level 2, such as the 1BMR, should only be used on non-NHS routes where the posted speed limit does not exceed 45 mph.

Use Design Manual Figure 6-131 (Figure 6-131m) to select the overlay type.

This policy shall be effective with the June 2006 letting. The Design Manual will be revised at a later date.

GRP/GM

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